a display configured to display an image generated based on the estimated quantitative data,

wherein the quantitative data is related to a thickness of the constituent substances.

2. The apparatus according to claim 1, wherein the quantitative data acquirer determines whether the estimated quantitative data satisfies a verification criteria to verify reliability of the estimated quantitative data.

3. The apparatus according to claim 2, wherein the quantitative data acquirer determines the estimated quantitative data to be the quantitative data of the constituent substances if it is determined that the estimated quantitative data satisfies the verification criteria.

4. The apparatus according to claim 3, wherein the quantitative data acquirer estimates new quantitative data by applying again the regularization function to the estimated quantitative data if it is determined that the estimated quantitative data does not satisfy the verification criteria.

5. The apparatus according to claim 4, wherein the quantitative data acquirer determines that the estimated quantitative data satisfies the verification criteria when iterative application of the regularization function is repeated a preset number of times.

6. The apparatus according to claim 4, wherein the quantitative data acquirer determines that the estimated quantitative data satisfies the verification criteria when an error value of the estimated quantitative data is equal to a reference value or less.

7. The apparatus according to claim 4, wherein the quantitative data acquirer determines whether the estimated quantitative data satisfies the verification criteria whenever the regularization function is applied.

8. The apparatus according to claim 4, wherein the quantitative data acquirer determines whether the estimated quantitative data satisfies the verification criteria whenever application of the regularization function is repeated a preset number of times.

9. The apparatus according to claim 4, wherein the quantitative data acquirer acquires quantitative data of the constituent substances on a per region basis, and the region includes a single pixel.

10. The apparatus according to claim 9, further comprising a map generator that generates and stores a quantitative data map on a per constituent substance basis, the quantitative data map including the acquired quantitative data mapped on a per region basis.

11. The apparatus according to claim 9, further comprising a substance image former that forms a substance image containing the acquired quantitative data of the constituent substances.

12. The apparatus according to claim 11, wherein the substance image former causes brightness of each pixel corresponding to the constituent substances to have a value corresponding to the quantitative data of corresponding constituent substances.

13. The apparatus according to claim 11, further comprising an input unit that receives input selection for the constituent substances,

wherein the substance image former forms the substance image of the selected constituent substances.

14. The apparatus according to claim 11, wherein a plurality of substance images is formed, and

the substance image former causes different color channels to be mapped respectively to the plurality of substance images and composes the plurality of substance images to which the different color channels have been mapped.

15. A control method for an X-ray imaging apparatus, the method comprising:

acquiring phase contrast image signals of an object on a per energy band basis, by emitting X-rays to the object and detecting the X-rays having passed through the object for each of a plurality of different energy bands;

calculating approximate quantitative data of two or more constituent substances of the object using a relation between the phase contrast image signals on the per energy band basis and quantitative data of the constituent substances;

estimating quantitative data of the constituent substances by iteratively applying a regularization function to the approximate quantitative data; and

displaying, on a display, an image generated based on the estimated quantitative data,

wherein the quantitative data is related to a thickness of the constituent substances.

16. The method according to claim 15, further comprising determining whether the estimated quantitative data satisfies a verification criteria to verify reliability of the estimated quantitative data.

17. The method according to claim 16, further comprising determining the estimated quantitative data to be the quantitative data of the constituent substances if it is determined that the estimated quantitative data satisfies the verification criteria.

18. The method according to claim 17, further comprising estimating new quantitative data by applying again the regularization function to the estimated quantitative data if it is determined that the estimated quantitative data does not satisfy the verification criteria.

19. The apparatus according to claim 1, wherein the X-ray source is configured to generate spatially coherent X-rays.

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